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A NEW METHOD FOR SECURING PARAFFIN SECTIONS TO THE SLIDE OR COVER-GLASS.

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Among the many steps to be taken in making microscopical preparations, that of securing the sections to the slide may seem of minor importance, yet the possibility of ultimate, successful results depends largely on the complete reliance to be placed upon the process by which this step is accomplished. Especially is this true of serial sectioning when the disarrangement of the sections renders the slide almost worthless. In Lee's compilation of microscopical methods, "The Microtomist's Vade-Mecum," there are about a dozen different processes given for fixing paraffin sections to the slide. These processes fall into two natural divisions, those fitted for material stained *in toto* and those fitted for sections to be stained on the slide. Of those belonging to the second group, only a few admit of the use of both watery and alcoholic stains, and in most of them heat is an essential part of the process.

Many of the methods involve a previous coating of the slide with a substance that has to dry and be again moistened before the sections can be arranged upon it, such as collodion, shellac, or a gum-preparation. Some are useful for temporary slides, while in others the intricacy of the process greatly increases the chance of error, and adds to the time required for the work.

There are no methods given in Lee's work of an earlier date than 1880. One of the oldest is the Shellac Method, now no longer used. Schällibaum's collodion also is best fitted for bulk-stained objects. A slide is coated with a thin, even layer of one part of collodion to three or four volumes of clove or lavender oil. The sections are arranged and the slides heated over a water bath for five to ten minutes, or over a lamp for a shorter time, till the oil has evaporated. Gage and Summers use a pure collodion coat on the slide which is rendered adhesive by clove oil or ether-alcohol. There are many gum methods, but some forbid the use of watery fluids, and others are not fitted for alkaline stains.

Lee recommends Mayer's albumen for use with sections that have to be stained on the slide, and says that he has found it to be absolutely reliable. There is no need to describe so well-known a method, the principle is the coagulation of a thin layer of albumen by the use of heat. It is just at this point that the element of uncertainty comes into the process; much heat will injure the tissue, and in avoiding this danger there is a great probability of applying too little heat to coagulate the albumen.

Among other methods given by Lee is one recommended by Strasser, (Zeit. f. wiss. Mikr., IV. 1. 1887, p. 45). It consists of coating the slides thinly and evenly with a mixture of two parts of collodion with one of castor oil—the per cent. of the collodion is not given. Sections are arranged on those prepared slides and coated with a thicker solution,—collodion concentratum duplex 2-3 parts, castor oil 2 parts; no warming is required, but the slide is put direct into a bath of turpentine for 2 to 10 hours to dissolve out the paraffin.

While working during the past year with serial sections, great trouble was experienced with Mayer's albumen method, and after some experimentation, the following plan was adopted: A layer of Mayer's albumen was spread on the slide and the sections arranged. Then a wash of $\frac{3}{4}$ per cent. collodion was spread over the surface evenly with a camel's hair brush. This coat is allowed to dry, which takes place in about one minute, but a longer time does no harm; practically, one slide dries while the next is being prepared. During the drying many small air bubbles appear, the presence of which indicates the right degree of dryness; these do not cause any inconvenience, as they disappear during the subsequent processes. When dry the slide is put, *without heating*, into a jar of xylol or benzin for half an hour or more, to dissolve the paraffin. A stay of several hours in the liquid will not injure the tissue. The paraffin may be removed in 3 to 5 minutes by constantly moving the slide in the benzin. The benzin or xylol is removed by 95% alcohol, and the sections are then stained and mounted as desired.

It was found best to have the liquid for removing the paraffin as fresh as possible, or else the thin film of collodion retained a sufficient amount of it to render the surface greasy; benzin was tried and proved in every way as satisfactory as xylol. Owing to its cheapness it is possible to use benzin in much larger quantities than xylol, and the requisite degree of freshness is easily obtained.

Many slides were prepared without the preliminary coating with albumen, and in all cases the collodion coat was sufficient to keep the sections fastened to the slide, but owing to the well-known uncertainty in making a film of collodion adhere to glass, the albumen was used as a safeguard against failure, the alcohol in the collodion serving to coagulate the albumen. Different per cent. solutions of collodion were tried and mixtures varying in the proportions of ether and alcohol. No difference was found in the results given by the various mixtures, but the $\frac{3}{4}\%$ solution was the most satisfactory.

The chief advantage of this method is that it dispenses with the need for an alcohol lamp ; an important and, in the hands of the inexperienced, a somewhat dangerous adjunct of the laboratory is thus removed from constant use. The greatest disadvantage is that, as in all collodion methods, the collodion is liable to take the stain and refuse to give up the color to treatment. Practically, however, in using the ordinary hematoxylins, eosin, picric alco hol, etc., there is no difficulty ; it is only with the stronger stains that trouble is found. The use of this thin coat of collodion is a simple and effective method for general histological purposes.